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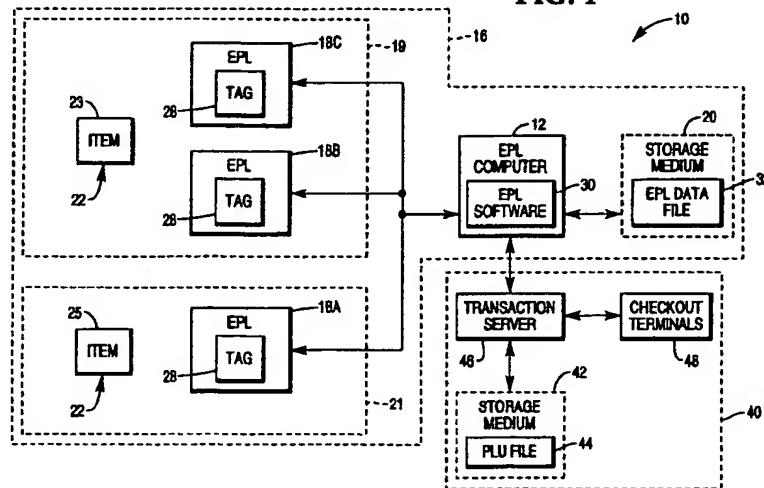
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### (54) Electronic price label system

(57) The invention provides for a system for assigning an address to an electronic price label (18A-18C) and which is not defined by the product (23, 25) to which the label is assigned. The invention also provides for a related method that includes the step of assigning a random number as the label address, or that includes the

step of assigning a number of digits of a serial number associated with the label as the label address. The invention can therefore facilitate marking of common product types with more than one electronic price label.

FIG. 1



**Description**

The present invention relates to shelf label systems, and more specifically to a method of assigning addresses to electronic price labels (EPLs).

EPL systems typically include a plurality of EPLs for each merchandise item in a store. EPLs typically display the price of corresponding merchandise items on store shelves and are typically attached to a rail along the leading edge of the shelves. EPLs may include a semi-transparent LCD. A store may contain thousands of EPLs to display the prices of the merchandise items. The EPLs are coupled to a central server from where information about the EPLs is typically maintained in an EPL data file. Price information displayed by the EPLs is obtained from the PLU file.

The EPLs are coupled to a central server from where prices for all of the displays can be changed. Each EPL has an assigned address which is typically stored within a register or memory location in the EPL. In order to change prices, the server addresses a price change message to an EPL. The EPL compares the address in the price change message to its own internally stored address. If the message address and the internal address match, the EPL executes the instructions in the message. If the message address and the internal address do not match, the EPL ignores the instructions in the message, or goes into an alternate mode to reflect information from other EPLs.

Known EPL systems use item information as a basis for assigning an address to an EPL. Item information is typically an order number or a price look-up file number. However, such EPL systems cannot be used in positive acknowledgment systems. Since positive acknowledgment systems typically include instances in which one PLU file item is positioned at more than one location in a store and in which multiple EPLs must be assigned to the same PLU file item, the originating EPL or EPLs of any acknowledgment messages cannot be determined.

Therefore, it is the object of the invention to provide a method of assigning addresses to electronic price labels that does not rely on item information.

According to the invention an electronic price label system comprising a plurality of addressable electronic price labels (18A-18C) for a plurality of products characterized in that at least one of the electronic price labels is arranged with an address which is independent of the product to which the electronic price label is assigned.

Also according to the invention a price label system as claimed in Claim 1 or 2, including a data file having separate entries for identifying products and for identifying electronic price labels.

The invention will now be described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram of an EPL system within a

store; and

Fig. 2 illustrates the contents of an EPL data file, including EPL addresses.

5 In Fig. 1, store system 10 includes EPL system 16 and transaction processing system 40.

EPL system 16 includes EPL computer 12, storage medium 20, and EPLs 18a-c.

10 EPL computer 12 executes EPL software 30, which processes messages to and from EPLs 18a-c and which maintains the contents of EPL data file 32. Messages to EPLs 18a-c include price change messages and status messages. Price change messages instruct EPLs 18a-c to change their displayed prices. Status messages test the operation of EPLs 18a-c by asking them to respond in a predetermined way, which may be as simple as returning an acknowledgment signal. EPL software 30 addresses messages to EPLs 18a-c using addresses assigned in accordance with the method of 15 the present invention.

EPL data file 32 contains identification information, item information, and price information for each of EPLs 18a-c. The identification information includes addresses assigned to EPLs 18a-c by EPL software 30.

20 25 EPL system 16 includes groups of EPLs. Group 19 represents a single PLU file item 23 which is located at two different places within the store and which requires multiple EPLs 18b-c. Group 21 represents a single PLU file item 25 which is located at one place within the store and which requires only one EPL 18a. EPL system 16 includes a plurality of EPLs assigned to PLU file item 22.

30 35 EPLs 18a-c are preferably wireless EPLs, each including a transceiver. EPL computer 12 couples to a plurality of transceivers throughout a store. EPLs connected to EPL computer 12 via cables are also envisioned.

Transaction processing system 40 includes transaction processing server 46 and storage medium 42.

40 Transaction processing server 46 processes requests for price and item information from individual checkout terminals 48.

Storage medium 42 contains PLU file 44, which contains the price and item information for item 22.

45 Turning now to Fig. 2, EPL data file 32 is shown in more detail. EPL data file 32 includes a line entry for each of EPLs 18a-c in EPL system 16. Each line entry has an item identification entry (ITEM ID), an EPL identification entry (EPL ID), and an EPL price checksum value entry (EPL CHECK). Known EPL systems do not maintain separate values for items and EPLs.

Entry ITEM ID identifies a store item and is preferably obtained and sometimes validated from PLU file 44.

50 Entry EPL ID identifies which EPL is assigned to the item and is used by EPL computer 16 as an address for transmitting messages to the EPL. Entry EPL ID is a "number" which may be any combination of numerals and letters. Each of EPLs 18a-c stores its EPL ID in an

internal register. When EPL computer 12 transmits a message, each EPL compares its internally stored EPL ID with one or more EPL IDs in the message.

Entry EPL CHECK is a checksum value of the digits of the price information that is displayed by EPLs 18a-c.

One method envisioned by the present invention and implemented by EPL software 30 is to record entry of EPL serial numbers and derive four-digit numbers from the last four digits of the serial numbers. Here, entry EPL ID is shown as a four-digit hexadecimal number, but other methods of representing addresses having more or less than four digits are also envisioned. The EPL serial numbers are numbers assigned to EPLs 18a-c at the factory where EPLs 18a-c were manufactured.

In this example, an EPL ID of 4733 corresponds to the address of EPL 18a. An EPL ID of 0301 corresponds to the address of EPL 18b. An EPL ID of 030D corresponds to the address of EPL 18c, which in this example has an EPL serial number with the same last four digits, 0301, as EPL 18b. Thus, EPL software 30 changed the last digit to a "D" to prevent two EPLs from having the same address.

An operator may manually enter the EPL serial numbers at a keyboard of EPL computer 12. Alternatively, EPL software 30 may read an electronic list of EPL serial numbers which is provided by the manufacturer on a portable storage medium, such as a floppy disk, or which is transferred to EPL computer 12 over a telephone line using modems.

When two or more EPLs have the same last four digits, EPL software 30 may replace, automatically or under operator control, one of the numbers, such as the last number, with a unique and arbitrary hexadecimal number.

Another method envisioned by the present invention is for EPL software 30 to use a random number generator to assign addresses to EPLs, or to use the next available number in sequence. This method would additionally require that the derived number be dissimilar to any other EPL identification number.

The method of the present invention assigns identification numbers to EPLs 18b-c that are not related to item 23, which allows EPL software 30 to manage EPLs 18b-c separately. EPL software 30 can receive and process positive acknowledgment messages from each of EPLs 18b-c.

Unlike EPL system 16, an EPL system that addresses EPLs using item information cannot determine whether all of the multiple EPLs assigned to a single item have successfully received and acknowledged a message from EPL computer 12. Multiple EPLs having the same address all acknowledge at the same time and EPL computer 12 cannot determine how many EPLs have acknowledged.

The method of the present invention may also be combined with systems that use item information to allow such systems to assign multiple EPLs to single

PLU file items. By having a cross reference table, an EPL system that identifies EPLs using item information can be converted. This cross reference table allows software to be written to translate the item information into an EPL identification. The disadvantage associated with this approach is that more communication to change an item results. The advantage is that the EPL computer 12 can guarantee that each EPL associated with an item changed. This advantage justifies EPL system 16 through pricing accuracy.

Although the present invention has been described with particular reference to certain preferred embodiments thereof, variations and modifications of the present invention can be effected within the spirit and scope of the following claims.

### Claims

1. An electronic price label system (10) comprising a plurality of addressable electronic price labels (18A-18C) for a plurality of products (22) characterized in that at least one of the electronic price labels is arranged with an address which is independent of the product (23, 25) to which the electronic price label is assigned.
2. An electronic price label system (10) as claimed in Claim 1, wherein said at least one of the electronic price labels includes a first electronic price label (18B) associated with a product (23) and having a first address, and a second electronic price label (18C) associated with the product (23) and having a second address different from the first.
3. A price label system (10) as claimed in Claim 1 or 2, including a data file (32) having separate entries for identifying products (23, 25) and for identifying electronic price labels.
4. A method of assigning an address to an electronic price label (18A-18C) comprising the step of assigning an address to the label which is independent of the product to which the electronic price label is assigned.
5. A method as claimed in Claim 4, and including assigning a random number as the electronic price label address.
6. A method as claimed in Claim 4, and including assigning a number of digits of a serial number associated with the electronic price labels as the electronic price label address.
7. A method as claimed in Claim 6, wherein the number of digits are sequential.
8. A method as claimed in Claim 7, wherein the

number of digits are sequential from an end of the serial number.

9. A method as claimed in any one of Claims 4 to 8, and for assigning an address to first (18B) and second (18C) electronic price labels associated with a common product (23) and comprising the steps of assigning a first identifier to the first electronic price label (18B), assigning a second identifier different from the first identifier to the second electronic price label (18C) so that a message for the first (18B) and second (18C) labels can be addressed thereto. 5
10. A method as claimed in any one of Claims 4 to 9, wherein entries for identifying products and for identifying electronic price labels are stored separately in a data file. 15

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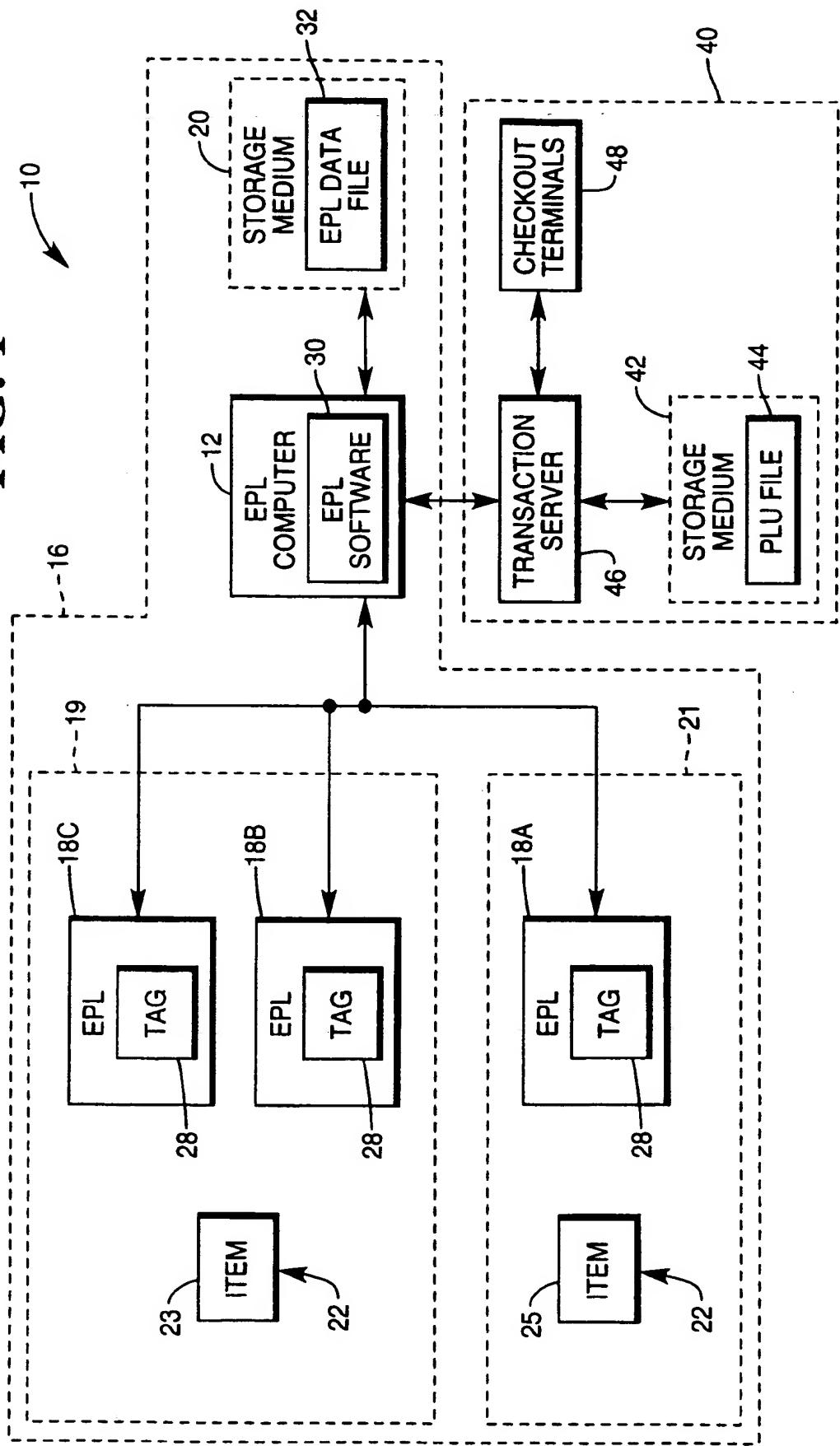
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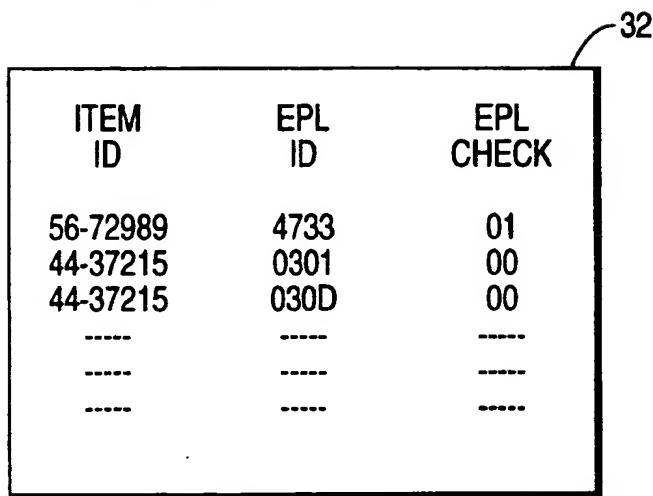
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**FIG. 1**

**FIG. 2**



A rectangular table with a black border. The top row contains three columns: 'ITEM ID', 'EPL ID', and 'EPL CHECK'. Below this, there are four rows of data. The first row has entries: 56-72989, 4733, 01. The second row has entries: 44-37215, 0301, 00. The third row has entries: 44-37215, 030D, 00. The fourth row has entries: ----, ----, ----. The fifth row has entries: ----, ----, ----. The sixth row has entries: ----, ----, ----.

ITEM ID	EPL ID	EPL CHECK
56-72989	4733	01
44-37215	0301	00
44-37215	030D	00
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